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ABSTRACT

A study examined the effects of age upon the amount and kind of explicit information in oral summary tasks of preschool and third-grade children. Findings show an important developmental change in the use and in the type of inferential operations. Preschool children used fewer connectors and were not as able to preserve the original order of propositions in the text compared to third graders. On the contrary, third-grade children showed the tendency to include most of the explicit information and they generated more textual inferred information, they were able to find the textual cues necessary for the retrieval of the elaborative information from long-term memory. Results also indicated that both groups may infer causal links between events and actions of a story in response to general task demands, and that they were able to know that these relations were important for understanding the story. Both groups activated automatic processes more easily than controlled processes. However, both groups had problems searching for bridging knowledge and making logical inferences. (Contains 2 tables of data and 12 references.) (Author/RS)

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THE INFERENTIAL OPERATIONS OF PRESCHOOL AND PRIMARY EDUCATION CHILDREN DURING NARRATIVE TEXTS COMPREHENSION

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ABSTRACT

This study was designed to examine the effects of age upon the amount and kind of explicit information in oral summary tasks of preschool and third grade children. Findings show an important developmental change in the use and in the type of inferential operations. Preschool children used less connectors and were worst able to preserve the original order of propositions in the text. Contrary, third grade children showed the tendency to include most of the explicit information and they generated more textual inferred information; they were be able to find the textual necessary cues for the retrieval of the elaborative information from long-term memory. We also find that both groups (preschool and 3rd Grade) may infer causal links between events and actions of a story in response to general task demands, they were be able to know that these relations are important for understanding the story. Both groups activated more easy automatic than controlled processes. However, both groups had problems to search for bridging knowledge and to make logical infereces.

Key words: inferences, reading comprehension, stories.

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INTRODUCTION

Kintsch (1988) have distinguished three levels of cognitive representation as a result of comprehending a text: the *surface code* preserves the exact wording and syntax of clauses; the *textbase* contains the explicit text propositions in a stripped-down form that preserves meaning, but not exact wording and syntax of text, the textbase only includes a small number of inferences that are needed to establish text coherence; finally, there is the referential *situation model* (mental representation of the people, setting, actions and events) of what the text is about. Situation models may vary in abstractness from bare-bone conceptual sketches to lifelike renditions of episodies in the real world. Most inferences generated during text comprehension are part of the constructed situation model (Graesser & Zwaan, 1995).

The term inference is used in three domains: as a word in everyday language, as a term in formal logic, and as a term in the cognitive sciences. As Kintsch (1993) points, the first use is unproblematic, the second is precise enough, however, it is difficult to avoid the conclusion that something is wrong with the third use of inference, because not much progress has been made in our understanding of "inferecing" in discourse comprehension. A large number of classification systems for inferences have been proposed. Inferences have been classified by content (Graesser, 1981), by direction (Singer & Ferreira, 1983), by function (Reder, 1980) or by their logical form (inductive, deductive and analogical inferences). Besides, Guthke (1991) has proposed characterizing inferences both by their results as well as the nature of the processes involved. He distinguishes between inferences that add information through retrieval from long-term memory versus inferences that, by mens of certain procedures, generate new information. In the latter espect, he focuses on the distintion betwen autonomic and controlled processes. Kintsch (1993) adopt and make up this model, proposing a triple classification scheme that is depicted in Table I.

	Accretion of Information		Reduction of Information	
	Retrieval	Generation	Deletion	Generation
Automatic Processes	A	B	E	F
	bridging inferences, associative elaborations	transitive inferences in a familiar domain	deletion of insignificant details	construction, generalization in familiar domains
Controlled Processes	C	D	G	H
	search for bridging knowledge	logical inference	extraction of main points	construction, generalization in unfamiliar domains

Table I. A classification system for inferences proposed by Kinsch, 1993 (after Guthrie, 1991)

In this context, this work tries to identify some of the inferential processes that we belive are central to the construction of situation model when narrative text is comprehended by young readers. It is an attempt to investigate the use of inferences in these children when they have to tell a story. For it, we will analyze the use of the eight types of inferences proposed by Kintsch (1993).

We used narrative texts because there are several reasons, which show that simple narrative passages constitute an ideal class of text for studying inference generation at this point in the science (Boulton, 1993; Marx & Henderson, 1993). The major reason is that readers generate many inferences when they comprehend simple narrative passages. Comparatively fewer infrences are generated in passages of other genres and to passages which embody words and concepts that are unfamiliar to comprehender (Casteel, 1993; Inman & Dickerson, 1995).

We consider the story comprehension as a framework of a "situation" state space. A point in situation-state space is specified by a collection of propositions, each of which can be have

values or either "present" or "absent". A story is represented as a partially specified trajectory in situation-state space, and thus, story comprehension is defined as a problem of inferring the most probable missing features of the partial specified story trajectory. The story-recall process is also viewed as a procedure that solves the problems of estimating the most probable missing features of a partially specific trajectory, but the partially specified trajectory in this latter case is an episodic memory trace of tyhe reader's understanding of the story (Golden & Rumelhart, 1993).

METHOD

Participants

Two groups of children from preschool and 3rd Grade (mean age: 5,7; 8,4) were used as subjects. All were classifed by teachers as having of average reading comprehension.

Materials

For our study, we developed a summarization task consisting of stories. The materials used were stories because for younger children the most familiar discourse form is the narrative. Children read and hear more narratives than all others types of extended discourse during their preschool and elementary school years and appear to be more proficient in processing narratives.

The stories consisted of a sequence of episodes, each episode having the same internal structure, denoted by the terms Frame, Theme, Plot and Resolution. Each of the plots consisted of two episodes in preschool text and four episodies in 3rd grade texts.

The context and the characters of text were familiar for children.

Design and Procedure

An intersubjects design was carried out.

Subjects were seen individually in an empty classroom. After introductions, children were invited to play some games with the experimenter.

When the child seemed to feel comfortable. Subjects were told, "I'd like us to listen to a story; and after you hear the story, you can make your own tape of the same story. Then we can listen to your tape together. Are you ready to listen to the story?".

The child listened the story and next, he/she was asked to record their stories.

Reading comprehension is a complex process influenced by representational, contextual, motivational and personal aspects. However, we try to control the motivational dimension, therefore, subjects received homogeneous instructions about their task, indicating that it is not an educational task. We do not tell them about the outcome of the task.

Scoring

The story reconstructions were scored for the use of inferences:

a) inferences (A): subject adds information and makes associative elaborations;

b) inferences (B): subject adds information and makes transitive inferences in a familiar domain;

c) inferences (C): subject adds information and searchs for bridging knowledge;

d) inferences (D): subject adds information and make logical inferences;

e) inferences (E): subject deletes the insignificant details in tha text;

f) inferences (G): occurs when subject selects the most important points in a text;

g) inferemces (H): occurs when subject makes constructions and generalizations in unfamiliar domains.

RESULTS

All protocols were scored independently by two graders. The correlations between graders' scores were high (about .96)

The percentage indices of the different measures of the dependent variabes are given in Table II.

TYPE OF INFERENCES								
	A	B	C	D	E	F	G	H
Preschool	4	39	0	0	10	40	8	0
3rd Grade	8	25	6	0	9	42	8	2

Table II. Percentages of inferences in preschool and 3rd grade group
(A): subject adds information and makes associative elaborations; (B): subject adds information and makes transitive inferences in a familiar domain; (C): subject adds information and searchs for bridging knowledge; (D): subject adds information and make logical inferences; (E): subject deletes the insignificant details in tha text; (G): occurs when subject selects the most important points in a text; (H): occurs when subject makes constructions and generalizations in unfamiliar domains.

An ANOVA of the total accuracy score was carried out. The results showed significant differences in the next type of inferences: A-bridging inferences, associative eleborations-($F_{(2,40)}$= 78,98; p<.01); B-transitive inferences-($F_{(2,40)}$ = 54,33; p<.01), C-search for bridging knowledge-($F_{(2,40)}$= 34,11; p<.01), and H-construction, generalization in unfamiliar domainds ($F_{(2,40)}$= 69,61; p<.05). Scheffè tests showed that children from preschool group make significantly more transitive inferences in a familiar domain (*B*) than children from 3rd grade group. Contrary, children from 3rd grade group make more inferences of *A* (associative elaborations), *C* (search for bridging knowledge), and *H* (construction and generalization in unfamiliar domainds) type than children from preschool group.

CONCLUSIONS

In general, the average pattern of findings supports the idea of preschool children have limited their inferential skills. It has been reflected as a general tendency to process literally text, element-by-element.

Firstly, our results showed that when stories were examined for features that corresponded to Kintsch's analysis older children's stories (third grade) made more inferences than younger children's narratives (preschool). They were more apt to make associative elaborations, to search for bridging knowledge and to consctruct and generalizate in unfamiliar domainds; and they were

be able to find the textual necessary cues for the retrieval of the elaborative information from long-term memory.

Secondly, we also find that both groups (preschool and 3rd grade children) may infer causal links between events and actions of a story in response to general task demands, they are be able to know that these relations are important for understanding the story. The use of generalization and construction operators by both groups means that they take a set of familar propositions and replace it with the appropiate superordinate constituent, and that they also replace a sequence of propositions describing the familiar details of events with a label for the events. As Gindon & Kintsch (1984) point such macro-operators can funct automatically during text comprehension and are applied routinely, not merely as a result of instruction to summarize a text. In this way, we think that this reason could explain the use of this type of inferences in younger children.

Thrirdly, we found that inferences of *B* and *D* type are more problematic for both schoolar groups. They have problems to search for bridging knowledge and to make logical infereces.

Fourtly, we also found differences betwen inferences that demands automatic processes and inferences that demands controlled processes. Results showed that it is easier to make inferences that add information than make inferences that generate new information. Both groups activated more easy automatic than controlled processes. The recently proposed model of a long-term working memory can serve as a framework for understanding of automatic knowledge elaboration processes in comprehension (Ericson & Kintsch, 1991). According with this model, large areas of long-term memory are turned into an expanded working memory in all kinds of cognitive processing, including text comprehension. Thus, the amount of knowledge that is directly avaible in comprehension is very large, compared to the information in the text itself. In the case of the automatic, on-line application of procedures for generation of new information (inferences type *B*), the knowledge elaboration is directly given, without further processing,

through the semantic and experimental links of the retrieval cues which are held in the focus attention. Here, we can asume that it is an easy inference because the information that the turtle is above the fish is not computed, but given directly through the spatial image that constitutes the situation model for the text.

REFERENCES

Boulton, M. J. (1993). A comparison of adults' and children's abilities to distinguish between aggressive and playful fighting in middle school pupils: Implications for playground supervision and behaviour management. *Educational Studies, Vol. 19 (2)*, 193-203.

Casteel, M. A. (1993). Effects of inference necessity and reading goal on children's inferential generation. *Developmental Psychology, Vol 29 (2)* 346-357.

Ericsson, K. A. & Kintsch, W. (1991). *Memory in comprehension and problem solving: A long-term working memory*. (Tech. Rep. ICS No. 91-13). Boulder: University of Colorado.

Golden, R.M. & Rumelhart, D.E. (1993). A parallel distributed processing model of story comprehension and recall. *Discourse Processes, Vol. 16 (3)*, 203-237.

Graesser, A.C. (1981). *Prose comprehension beyond the word*. New York: Springer-Verlag.

Guindon, R. & Kintsch, W. (1984). Priming macropropositions:evidence for the primacy of macropropositions in memory.*Journal of Verbal Learning and Verbal Behavior,23,* 508-518.

Guthke, T. (1991). *Psychologiste untersuchungen zu inferenzen beim satz.and textverstehen*. Unpublished doctoral dissertation. Humboldt Univertität, Berlin.

Inman, T. & Dickerson, D. (1995). Children's inferences of causal events during story understanding. *Journal of Genetic Psychology, 156 (3),* 265-277.

Kintsch, W. (1993). Information accretion and reduction in text processing: inferences. *Discourse Processes, 16,* 193-202.

Marx, M. & Henderson, B. (1993). Development of inferences over elementary-school grades: Affective bia as a determinant of inferences. *Bulletin of the Psychonomic Society Vol 31 (2),* 149-151.

Reder, L.M. (1980). The role of elaboration in the comprehension and retention of prose: A critical review. *Review of Educational Research, 50,* 5-53.

Singer, M. & Ferreira, F. (1983) Inferring consequences in story comprehension. *Journal of Memory and Language, 24,* 595-611.